

MEMORANDUM

TO: District Engineers

FROM: Lou Harmon, Southeast District Engineer

THROUGH: Larry Robinson, Water and Wastewater Engineering Program Manager

DATE: April 20, 2004

SUBJECT: Policy 14.14.4 Cross Connection Control - Dual Checks and Thermal Expansion

1. Chapter 12, Section 14(i), Table 1 limits the application of dual checks conforming to ASSE Standard 1024 to residential and domestic service connections.
2. Chapter 12, Section 4(k) is the definition of a dual check. The definition limits the use of dual checks to only residential services that have a low hazard potential.
3. Although poorly documented in the minutes of the Water Quality Advisory Board, it was the Advisory Boards intention that the use of dual checks be limited to residential service connections. The definition of dual check was rewritten to reflect this guidance. For this reason, the requirements of the definition of a dual check prevail over the slightly broader application of a dual check suggested by Table 1.
4. Whenever a backflow prevention device is installed on a residential service connection, potential problems due to thermal expansion of cold water in the hot water heater are created. The methods for addressing thermal expansion are strictly a choice of the owner of the property served, the public water supplier, and the local code authority. It is the recommendation of the Water Quality Division that the public water supplier fully inform the property owners of the potential problems due to thermal expansion downstream of a backflow prevention device.

Sec. 10 (cont.)

Steps:

a. For each pertinent Section of the Specifications inspect, test or otherwise be assured that the assembly meets the minimum conditions of these specifications.

10.2.4 DESIGN, OPERATIONAL AND EVALUATION SPECIFICATIONS FOR PRESSURE TYPE VACUUM BREAKER ASSEMBLIES

10.2.4.1 Design and Operational Specifications

a. This assembly shall include an approved internally loaded check valve and a loaded air opening to atmosphere on the discharge side of the check valve between two tightly closing shut-off valves; and, will include two properly located test cocks. (See Fig. 10-3).

b. The air inlet valve of the vacuum breaker shall open when the internal pressure is a minimum of 1 psi (6.89 KPa). It shall be fully open when the water drains from the body.

c. The maximum allowable pressure drop across the assembly, from the upstream face of the No. 1 shut-off valve to the downstream face of the No. 2 shut-off valve, shall not exceed 10 psi (68.94 KPa) for any rate of flow up to and including the rated flow listed in Table 10-5.

d. The check valve shall be internally loaded and shall at all times be drip-tight in the normal direction of flow with the inlet pressure at 1 psi (6.89 KPa) and the outlet under atmospheric pressure.

e. The effective size of the air inlet port(s) of the assembly shall be governed by the vacuum dissipation test. If an air inlet port shield or canopy is used, it shall extend down around the body of the assembly to the lowest portion of the port(s). To reduce potential for fouling, the minimum clearance between the air inlet port(s) and the shield or canopy shall be 3/16 inch (5 mm).

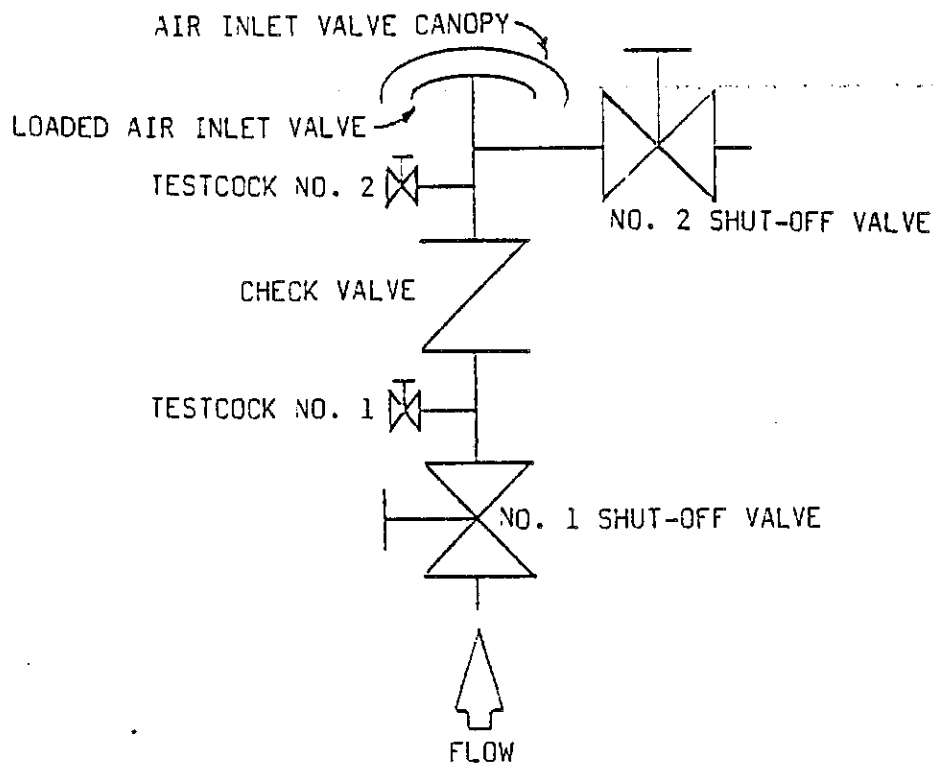


FIG. 10-3
PRESSURE VACUUM BREAKER
BACKFLOW PREVENTION ASSEMBLY
DIAGRAMMATIC SKETCH SHOWING
LOCATION OF SHUT-OFF VALVES,
CHECK VALVE, AIR INLET VALVE,
AND TESTCOCKS

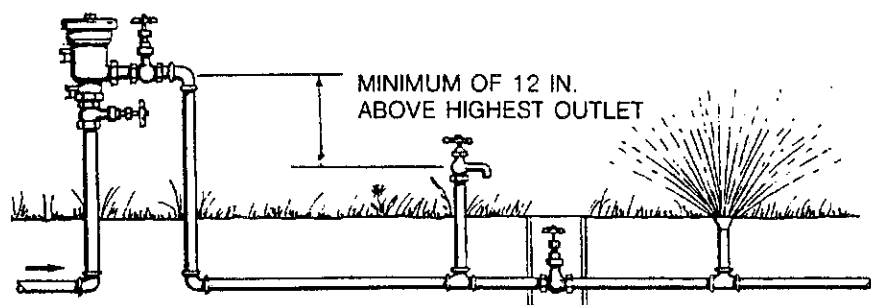
B. How a pressure vacuum breaker works

1. The spring-loaded check valve opens during normal flow, and closes under no-flow or reversed-flow conditions.
2. When supply pressure drops below atmospheric pressure, air pressure opens the air-inlet, which breaks the vacuum. The check valve closes simultaneously, preventing backflow from occurring.

C. Where a pressure vacuum breaker is used, based on degree of hazard and pressure conditions

1. A pressure vacuum breaker can be installed in situations where it will be under continuous supply pressure for long periods of time.
2. A pressure vacuum breaker can be used in almost any installation that will not subject the device to back pressure, regardless of the degree of hazard.
3. Pressure vacuum breakers are frequently installed in sprinkler systems, saturators, and commercial dishwashing systems.

Figure 25 Approved Installation of Pressure Vacuum Breaker



Downstream side of vacuum breaker may be maintained under pressure by a valve but there should be absolutely no possibility of imposing back pressure by pump or other means.

IV. Pressure vacuum breakers

A. What a pressure vacuum breaker is

1. A pressure vacuum breaker contains one or two independently operating, spring-loaded check valves and an independently operating, spring-loaded air-inlet valve located on the discharge side of the check valve.
2. A pressure vacuum breaker has a test cock and shutoff valve at each end of the device.
3. Pressure vacuum breakers are designed to prevent backsiphonage.

Figure 24 Pressure Vacuum Breaker

